

**WHAT IS CLAIMED IS:**

1. A system for providing data service connection of subscriber communication equipment to a point-of-presence (POP) via a medium voltage power line, the subscriber communication equipment being located at a subscriber location provided with electric power via a low voltage power line that is connected to the medium voltage power line via a transformer, the system comprising:

an aggregation point (AP) adapted to interface the medium voltage power line with the POP;

a power line bridge (PLB) adapted for connection between a low voltage side of the transformer and a medium voltage side of the transformer so as to enable flow of communications signals between the low voltage power line and the medium voltage power line; and

a power line interface device (PLID) adapted for connection between the subscriber communication equipment and the low voltage power line providing electric power to the subscriber location;

wherein data service connection of the subscriber communication equipment to the POP is effected by the combination of the PLID, the low voltage power line, the PLB, the medium voltage power line, and the AP.

2. The system for connecting subscriber communication equipment to a POP of claim 1, wherein the AP comprises:

a backhaul interface adapted for connection to the POP;

an isolator connected to provide power isolation between the POP and the medium voltage power line;

a medium voltage modem connected between the backhaul interface and the isolator; and

a medium voltage coupler connected to the isolator and adapted to provide connection of the isolator to the medium voltage power line so as to pass communication signals without passing medium voltage power.

**3.** The system for connecting subscriber communication equipment to a POP of claim 1, wherein the PLB comprises:

a data router; and

one or more isolators to provide electrical isolation from the low voltage power line and the medium voltage power line.

**4.** The system for connecting subscriber communication equipment to a POP of claim 3, wherein the one or more isolators comprise a first isolator and a second isolator, the first isolator being connected to provide power isolation between the data router and the medium voltage power line and the second isolator being connected to provide power isolation between the data router and the low voltage power line.

**5.** The system for connecting subscriber communication equipment to a POP of claim 4, wherein the PLB further comprises:

a medium voltage modem, connected between the data router and the first isolator, adapted to provide modulation and demodulation appropriate to the channel characteristics of the medium voltage power line;

a medium voltage coupler connected to the first isolator and adapted to provide connection of the first isolator to the medium voltage power line so as to pass communication signals without passing medium voltage power;

a low voltage modem, connected between the data router and the second isolator, adapted to provide modulation and demodulation appropriate to the channel characteristics of the low voltage power line; and

a low voltage coupler connected to the second isolator and adapted to provide connection of the second isolator to the low voltage power line so as to pass communication signals without passing low voltage power.

6. An aggregation point for interfacing a medium voltage power line with a point-of-presence, the aggregation point comprising:

a backhaul interface adapted for connection to the point-of-presence;  
an isolator connected to provide power isolation between the point-of-presence and the medium voltage power line;

a medium voltage modem connected between the backhaul interface and the isolator; and

a medium voltage coupler connected to the isolator and adapted to provide connection of the isolator to the medium voltage power line so as to pass communication signals without passing medium voltage power.

7. A power line bridge for enabling flow of communications signals between a low voltage power line and a medium voltage power line, the low voltage power line being connected to a low voltage side of a transformer and the medium voltage power line

being connected to a medium voltage side of the transformer, the power line bridge comprising:

a data router; and

one or more isolators to provide electrical isolation from the low voltage power line and the medium voltage power line.

8. The power line bridge of claim 7, wherein the one or more isolators comprise a first isolator and a second isolator, the first isolator being connected to provide power isolation between the data router and the medium voltage power line and the second isolator being connected to provide power isolation between the data router and the low voltage power line.

9. The power line bridge of claim 8, wherein the power line bridge further comprises:

a medium voltage modem, connected between the data router and the first isolator, adapted to provide modulation and demodulation appropriate to the channel characteristics of the medium voltage power line;

a medium voltage coupler connected to the first isolator and adapted to provide connection of the first isolator to the medium voltage power line so as to pass communication signals without passing medium voltage power;

a low voltage modem, connected between the data router and the second isolator, adapted to provide modulation and demodulation appropriate to the channel characteristics of the low voltage power line; and

a low voltage coupler connected to the second isolator and adapted to provide connection of the second isolator to the low voltage power line so as to pass communication signals without passing low voltage power.